

## Eugene Shenderov

Exploiting immunology to fight cancer

Ph.D Training: NIH-Oxford Scholars Program

M.D. Training: Johns Hopkins University

“Overall, pursuing my PhD has been a thoroughly stimulating endeavor and provided a wonderful opportunity to expand my horizons both academically and socially —through my travels in Europe and living in Oxford. If I had to pick the single most exciting experience of my PhD it would be the process of generating a novel transgenic mouse. It is humbling to partake in the use of science to fundamentally alter the basic existence of an organism with the express goal of yielding answers to biological mysteries and treatments for medical problems.”

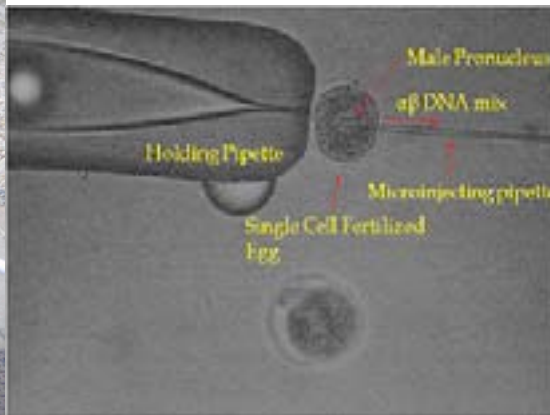


Eugene Shenderov was Born in Chernovtsy Ukraine and moved to Brooklyn NY when he was 5 years old. From a very early age Eugene's parents encouraged him to ask the question "why?" As a result, he developed a keen interest in designing small experiments that would help him understand how things worked. However, he really got "hooked on science" at the age of 16, when he had an opportunity to conduct summer research on melanoma, lymphoma, and prostate cancer in Dr. Alan Houghton's laboratory at Memorial Sloan-Kettering Cancer Center. While conducting research at Sloan-Kettering, he became a semifinalist in the prestigious Intel Science Talent Search competition. After completing high school, he went to college at Brooklyn College of the City University of New York (CUNY) on a full presidential scholarship. During his junior year at Brooklyn, he received the Furman Undergraduate Travel Stipend, which provided him one of his first opportunities to travel abroad, where he worked with Dr. Cerundolo at the Weatherall Institute of Molecular Medicine at the University of Oxford. He enrolled in an eight-year combined B.A./M.D. program and ultimately graduated with honors in 2005 as the valedictorian of his class of 1661 students. He received a Bachelor of Arts in Chemistry, and minors in biochemistry, biology, and nutrition. Some of his many awards include a Irving R. and Pauline K. Shaw Chemistry Scholarship (2004), Louis Gibofsky Memorial Award (2005), CUNY Scholar-Athlete of the Year Honorable Mention (2005), Peter F. Vallone Academic Scholarship (2001-2005), New York City Merit Scholarship Award (2001-2005), Jesse R. Meer Memorial Scholarship (2003-2004), the Joseph Waldstricher Memorial Scholarship (2003-2004), and a Rhodes Scholarship in 2005.



Standing in Jon's office at the NIH from right to left: Vincenzo Cerundolo, Jonathan W. Yewdell, Eugene Shenderov, Jack R. Bennink

Eugene's decision to join the Ox-Cam program was based on four interdependent reasons: 1) the unique opportunity to conduct research at both the NIH (US) and Oxford (Europe), and hence have the opportunity to live in Oxford; 2) a more independent and flexible PhD program based on the UK system; 3) ability to obtain both an MD and PhD; and 4) he already knew a UK mentor and wanted to work in his lab for his PhD. Eugene's thesis project was entitled "*In vivo* and *In vitro* Studies of T-Cell Receptor-ligand-MHC Affinity and T-Cell Function". The project was jointly mentored by Prof. Vincenzo Cerundolo located at the Cancer Research UK Tumor Immunology Unit, Weatherall Institute of Molecular Medicine, John Radcliffe Hospital, Oxford, UK and Dr. Jonathan Yewdell and Jack Bennink, who jointly head the Laboratory of Viral Diseases, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, Maryland, U.S.A. The goal of Eugene's research was to develop vaccination strategies to optimize the immune system's ability to detect and eradicate cancerous tissue, with the aim of better tailoring immunotherapy to an individual cancer patient's needs. Specifically, his PhD explored the recognition of tumour and viral antigens by T lymphocytes. One facet of his research focused on the CD1d molecule, which presents glycolipids to NKT cells.



*Left: Eugene, Jon, and Enzo at Merton College, Oxford. Right: Pronuclear microinjection into mouse embryos to generate transgenic mice*

During his PhD training, Eugene had the opportunity to attend numerous meetings, including a Keystone symposium and several international meetings. He found the Keystone meeting particularly exciting because of the “cutting edge research that was presented and the ability to meet the scientists behind the discoveries.” In 2009, he had the opportunity to attend the national MD/PhD conference, where he heard leaders like Dr. Ralph Steinman discuss how dendritic cells were first identified.

Eugene has received several awards during his PhD training, including an NIAID, NIH Travel Award to attend the 2009 National MD/PhD Student Conference and a Magdalen College, Oxford, Research Travel Grant. He was selected to give an oral presentation at the 2008 annual NIH, Immunology Interest Group Retreat entitled “Designing a Better T Cell: Correlation of the Biophysical Properties of T Cell Receptor-Peptide-MHC Interactions and T Cell Function.” After completing his PhD in July 2009, Eugene returned to Johns Hopkins University in Baltimore to complete his medical training.

Outside of his busy school schedule, Eugene has enjoyed many interesting activities. During his undergraduate years, he joined the Brooklyn College emergency medical squad, where he provided primary pre-hospital emergency care to Brooklyn College students, faculty and people in the surrounding community. He also volunteered as a Biology, Chemistry and Physics tutor at the Edward R. Murrow High School in New York City. He currently enjoys running (NYC marathon 2006), playing chess, biking, playing tennis (4yrs of NCAA in college), hiking and fishing. He and his wife enjoy travelling and cooking together.



*Eugene and his wife, Maryana, proudly holding a large snook they just caught.*

Eugene plans to become a researcher and Oncologist after earning his MD/PhD because he “wants to help individuals survive their battles with cancer and heal the emotional scars that cancer leaves, and ultimately discover more effective cancer treatment modalities.”

## **PUBLICATIONS**

Stewart-Jones G., Wadle A., Hombach A., **Shenderov E.**, et al. Rational development of high-affinity T-cell receptor-like antibodies. PNAS **106**(14), 5784-5788 (2009).

Ishizuka, J., Grebe K., **Shenderov E.**, et al. Quantitating T Cell Cross-Reactivity for Unrelated Peptide Antigens. J. Immunol. **183**(7), 4337-45 (2009).

Aleksic M., Dushek O., Zhang H., **Shenderov E.**, et al. Dependence of T cell antigen recognition on TCR/pMHC confinement time. Immunity. 2010 Feb. 3.